

PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

To:

Commissioner
US Department of Commerce
United States Patent and Trademark
Office, PCT
2011 South Clark Place Room
CP2/5C24
Arlington, VA 22202
ETATS-UNIS D'AMERIQUE
in its capacity as elected Office

Date of mailing (day/month/year) 02 April 2001 (02.04.01)	
International application No. PCT/US00/17441	Applicant's or agent's file reference RCA89349
International filing date (day/month/year) 26 June 2000 (26.06.00)	Priority date (day/month/year) 15 July 1999 (15.07.99)
Applicant PUGEL, Michael, Anthony et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:
09 February 2001 (09.02.01)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was

☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Authorized officer

Zakaria EL KHODARY

Facsimile No.: (41-22) 740.14.35

Telephone No.: (41-22) 338.83.38

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



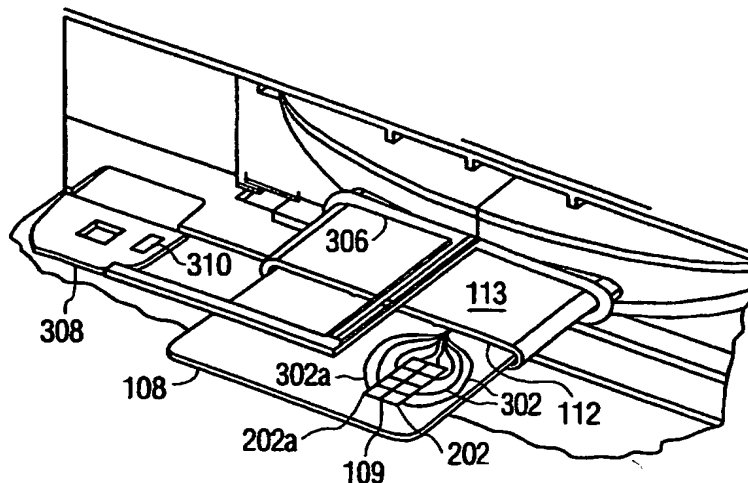
(43) International Publication Date
25 January 2001 (25.01.2001)

PCT

(10) International Publication Number
WO 01/06783 A1

- (51) International Patent Classification⁷: H04N 7/16, G06K 13/08, H05K 5/02
- (21) International Application Number: PCT/US00/17441
- (22) International Filing Date: 26 June 2000 (26.06.2000)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data: 60/143,844 15 July 1999 (15.07.1999) US
- (71) Applicant (for all designated States except US): THOMSON LICENSING S.A. [FR/FR]; 46, quai Alphonse Le Gallo, F-92648 Boulogne Cedex (FR).
- (74) Agents: TRIPOLI, Joseph, S. et al.; Thomson multimedia Licensing Inc., P.O. Box 5312, 2 Independence Way, Princeton, NJ 08540 (US).
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): PUGEL, Michael, Anthony [US/US]; 20925 Creek Road, Noblesville, IN 46060 (US). DUFFIELD, David, Jay [US/US]; 5459 Fall Creek Road, Indianapolis, IN 46220 (US). RAMSPACHER, Robert, James [US/US]; 13047 Lansdown Drive, Fishers, IN 46038 (US).
- Published:
— With international search report.
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: APPARATUS AND ASSOCIATED METHOD FOR LIMITING ACCESS OF INFORMATION TRANSFERRED BETWEEN AN ELECTRONIC SECURITY DEVICE AND A HOST DEVICE



(57) Abstract: A device for sensing unauthorized use of an electronic security device, the device comprising a host device and a port detector. The host device comprises a housing having a port formed therein, the port is configured to receive the electronic security device. In one embodiment, a port detector is located proximate to said port for sensing radiation emitted from unauthorized use of the electronic security device. In an alternate embodiment, the dielectric constant of the electronic security device is measured and compared to a predetermined value.



WO 01/06783 A1

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 00/17441

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H04N7/16 G06K13/08 H05K5/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04N G06K H05K G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 96 00951 A (URMET SPA ; MONDARDINI MASSIMO (IT)) 11 January 1996 (1996-01-11) the whole document ---	1,8-11, 13,14
A	EP 0 880 311 A (MATSUSHITA ELECTRIC IND CO LTD) 25 November 1998 (1998-11-25) figure 20 ---	2,4-6
A	EP 0 706 291 A (NEWS DATACOM LTD) 10 April 1996 (1996-04-10) the whole document ---	1,11
A	EP 0 565 281 A (NHK SPRING CO LTD) 13 October 1993 (1993-10-13) the whole document -----	1,11

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

6 October 2000

Date of mailing of the international search report

13/10/2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Toussaint, F

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 00/17441

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9600951 A	11-01-1996	IT T0940534 A	29-12-1995
		AU 2924795 A	25-01-1996
EP 0880311 A	25-11-1998	WO 9815161 A	09-04-1998
EP 0706291 A	10-04-1996	IL 111151 A	24-09-1998
		AU 696725 B	17-09-1998
		AU 3303695 A	18-04-1996
		CA 2159779 A	04-04-1996
		JP 8214278 A	20-08-1996
		US 5666412 A	09-09-1997
		US 5774546 A	30-06-1998
		US 5878134 A	02-03-1999
EP 0565281 A	13-10-1993	JP 5289612 A	05-11-1993

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

REC'D 10 AUG 2001



Applicant's or agent's file reference RCA89349		FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/US00/17441	International filing date (day/month/year) 26/06/2000	Priority date (day/month/year) 15/07/1999	
International Patent Classification (IPC) or national classification and IPC H04N7/16			
Applicant THOMSON LICENSING S.A. et al.			

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 8 sheets, including this cover sheet.
 - ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 3 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 09/02/2001	Date of completion of this report 08.08.2001
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Loeser, E Telephone No. +49 89 2399 8482 

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/US00/17441

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

1-11 as originally filed

Claims, No.:

1-8 as received on 27/06/2001 with letter of 25/06/2001

Drawings, sheets:

1-3 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/US00/17441

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims 1-8
	No: Claims
Inventive step (IS)	Yes: Claims
	No: Claims 1-8
Industrial applicability (IA)	Yes: Claims 1-8
	No: Claims

2. Citations and explanations
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/US00/17441

1. General

The present application does not satisfy the criteria set forth in Articles 6 and 33(3) PCT. Details of the objections are set out below.

2. Concerning Section VIII - Art. 6 PCT:

2.1. Claim 1

With the characterizing feature "the unauthorized modification includes coupling ..." an attempt is made to specify the subject-matter of an apparatus in terms of a feature that is external to the apparatus and to which the apparatus is apparently design to respond. It is considered that such a feature positioned in the characterizing portion casts doubt upon the claim's intended scope of protection (Art. 6 PCT contravened). It is considered that the feature should be positioned in the preamble, instead.

2.2. Claims 3, 6

The scope of claims of claims 3 and 6 is obscured by features put in angled brackets.

3. Concerning Section V - Articles 33(2) and 33(3) PCT

The following documents are cited:

D1: WO-A-96/00951;

D2: EP-A-0 880 311.

3.1. Claim 1

D1 (abstract; p.1 lines 3-5; p.2 lines 4-29; p.6 lines 22-25; p.5 line 23 -p.6 line 3) anticipates all features of claim 1 with the exception that claim 1 effectively specifies
- providing as the port detector a loop antenna around the port opening for detecting (magnetic fields due to) time-varying

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/US00/17441

currents passing along (unauthorized) conductors extending through the port,
whereas D1 discloses
- providing as the port detector a capacitive antenna ("laminae" 17, 17') at the port opening for detecting a time varying electric field that is changed due to the presence of unauthorized conductors extending through the port.

The difference identified above amounts to detecting (changes of) magnetic fields instead of detecting (changes of) electric fields. Accordingly the claim specifies a loop antenna whereas D1 discloses an antenna that responds to electric fields.

The skilled person routinely seeking alternatives to the design disclosed in D1 would have considered, as an obvious design option, replacing the disclosed antenna with an antenna of a different type, in accordance with the specific requirements, and without exercise of an inventive step.

The skilled person would thus have considered using a loop antenna as exemplarily disclosed in D2 instead of the different antenna disclosed in D1. This is because the skilled person was readily aware that each time-varying electromagnetic field has both an electric and a magnetic field component, and therefore detecting the magnetic field is equivalent to detecting an electric field.

It is to be noted that although D2 discloses a loop antenna in relation to detecting leakage of radiation through a shielding, the skilled person has been aware, almost from the beginning of developments in the field of radiated waves, of the capability of loop antennas to detect magnetic fields. Using a loop antenna instead of another type of antenna is obvious from standard textbooks.

For the reasons given above, the subject-matter of claim 1 contravenes Art. 33(3) PCT.

3.2. Claim 6

In comparison to claim 1, claim 6 provides further detail as to
(a) the detection of the radiation which requires that a time-varying current is provided in the (unauthorized) conductors; and provides

(b) a determination step to determine whether an unauthorized use of the electronic security device is made based on a capacitance (value) detected by a signature signal detected at the loop antenna.

These additional features imply the following steps:

- firstly, a time-varying electric signal is provided to the conductors that establish contact between the host device and the electronic security device;
- secondly, the time-varying electric signal establishes a current in any unauthorized wire that extends through the port, and thus a change of overall current;
- thirdly, the current change via its respective change of induced magnetic field component is detected;
- fourthly, from the current change, a change in capacitance of the device is detected (which implicitly has to differ from a standard capacitance) which change is large enough to conclude that there is unauthorized use of the security device.

D1 also discloses the first step identified above, which unavoidable results the second step, so that the first and second steps are not novel in comparison to D1.

As to the third step, the authors of D1 selected to detect the electric field, instead of the magnetic field as claimed. The third step lacks an inventive step, as set out in paragraph 3.1 above in relation to claim 1.

As to the fourth step, the authors of D1 having selected detecting the electric field had to compare a received field strength value with a standard (threshold) value so as to determine

unauthorized use of the security device.

Thus evaluating the presence of an inventive step by claim 1 can be reduced to the question whether it was obvious or not to replace a determination based on a threshold and a detected electric or magnetic field component with a determination based on a threshold and a capacitance value determined from a detected field component.

Detecting radiation can be carried out by sensing of time-varying electric field. Such sensing unavoidably leads to the detection of a voltage signal representative of the media penetrated by the fields. This is well-known in the art and widely used in many fields of industry, such as in determining properties of organic or non-organic matter.

Any such known detection of a change in electric fields depending upon the material provided in a test volume is commonly designated as dielectric constant measurement which is equivalent to capacitance measurement.

Generally speaking detecting a capacitance is equivalent to detecting a dielectric constant in a test volume. To determine the capacitance, at least one of fields in the test volume must be detected, as is effected in both D1 and according to claim 6. It is well-known (textbook knowledge) in the art that capacitance and field strength are correlated. Thus it is considered a mere obvious design option of the skilled person to replace a determination based on detected field strength with a determination based on a capacitance value derived from a detected field strength. Accordingly, claim 6 is considered to contravene Art. 33(3) PCT.

3.3. Dependent claims

In light of the findings set out above, the explicit and implicit disclosure of D1 and the normal skills of the skilled person, an inventive step cannot be identified in any of the

additional features of the dependent claims.

4. Concerning Section VII: Description and other belongings

(a) Documents reflecting the prior art described on pages 1 and 2 are not identified in the description (Rule 5.1(a)(ii) PCT).

(b) Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the document D1 is not summarized and the document not identified in the description.

(c) The description (p.9 lines 29 and 35) refers to capacitance values in terms of pico Farads derived from dielectric constants. The respective passages are obscured by the fact that areas' values (such as cm^2) with which the capacitance values are necessarily linked are not provided.

(d) The described features
"electromagnetic radiation consisting of both an electrostatic field ..." (p.7 lines 5-6) and
"electrostatic radiation" (p.8 lines 29 and 38)
are obscure and self-contradicting because radiation is only definable in conjunction with time-varying electromagnetic fields which are thus non-static. Electromagnetic radiation is defined as the vector product of time-varying magnetic and electric fields and can also be expressed in terms of the squares of magnetic or electric field amplitudes. An "electrostatic field" might also be present, but cannot be linked with "radiation".

What is claimed is:

1. An apparatus sensing unauthorized use of an electronic security device, the
5 apparatus comprising:
 - a host device comprising a housing having a port formed therein, the port is configured to receive the electronic security device; and
 - a port detector, located proximate to said port for sensing radiation
10 emitted from unauthorized modification of the electronic security device.
2. The apparatus set forth in claim 1, further comprising a limiting device that
limits operation of the host device if the port detector senses unauthorized used
of the electronic security device.
- 15 3. The apparatus set forth in claim 1, wherein the port detector senses
electromagnetic energy produced by unauthorized use of the electronic security
device.
4. The apparatus set forth in claim 1, wherein the port detector comprises a
20 loop antenna positioned adjacent the port.
5. The apparatus set forth in claim 4, wherein when the electronic security
device is inserted in the port, the loop antenna extends around the port.
- 25 6. The apparatus set forth in claim 1, wherein the port detector detects
electromagnetic radiation occurring at the port having a prescribed frequency.
7. The apparatus set forth in claim 6, wherein the signature signal is detected
by the port detector as magnetic radiation, and the detector is an antenna.
30
8. The apparatus set forth in claim 1, wherein the signature signal is detected
by the port detector as electrostatic radiation, and the detector measures
capacitance.
- 35 9. The apparatus set forth in claim 1, wherein the signature signal is detected
by the port detector as a capacitance value.
10. The apparatus set forth in claim 1, wherein the electronic security device is
a smart card.

11. A method of determining unauthorized use of an electronic security device comprising:

5 monitoring radiation received adjacent a port to detect unauthorized use of the electronic security device.

12. The method set forth in claim 11, further comprising the act of limiting transfer of the information between the electronic security device and the host device if said radiation similar to the signature signal is sensed during the
10 monitoring act.

13. The method set forth in claim 11, wherein the electronic security device is a smart card.

15 14. An apparatus sensing unauthorized use of an electronic security device, the apparatus comprising:

a host device comprising a housing having a port formed therein, the port is configured to receive the electronic security device; and

20 a port sensor, located proximate to said port for measuring a dielectric constant of an electronic security device inserted in the port.

PATENT COOPERATION TREATY

EXPRESS MAIL

FL 902321 807 US

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

RECEIVED

AUG 13 2001

PCT IS&S

To:

TRIPOLI, Joseph S.
THOMSON MULTIMEDIA LICENSING INC.
P.O. Box 5312
2 Independence Way
Princeton, New Jersey 08540
ETATS-UNIS D'AMERIQUE

DT

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL PRELIMINARY
EXAMINATION REPORT
(PCT Rule 71.1)

Date of mailing
(day/month/year) 08.08.2001

Applicant's or agent's file reference
RCA89349

IMPORTANT NOTIFICATION

International application No.
PCT/US00/17441

International filing date (day/month/year)
26/06/2000

Priority date (day/month/year)
15/07/1999

Applicant
THOMSON LICENSING S.A. et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Event	Notif IPER	Final Countries to Davida
Deadline	15 Nov 2001	
Entered	DPE	8/16/01

Name and mailing address of the IPEA/

European Patent Office
D-80298 Munich
Tel. +49 89 2399 - 0 Tx: 523656 epmu d
Fax: +49 89 2399 - 4465

Authorized officer

Schalinatus, D

Tel. +49 89 2399-8242



PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference RCA89349	FOR FURTHER ACTION		See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/US00/17441	International filing date (day/month/year) 26/06/2000	Priority date (day/month/year) 15/07/1999	
International Patent Classification (IPC) or national classification and IPC H04N7/16			
Applicant THOMSON LICENSING S.A. et al.			

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 8 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 3 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 09/02/2001	Date of completion of this report 08.08.2001
Name and mailing address of the international preliminary examining authority: <div style="display: flex; align-items: center;"> <div> European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465 </div> </div>	Authorized officer Loeser, E Telephone No. +49 89 2399 8482



**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/US00/17441

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

1-11 as originally filed

Claims, No.:

1-8 as received on 27/06/2001 with letter of 25/06/2001

Drawings, sheets:

1-3 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

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- ☐ the language of publication of the international application (under Rule 48.3(b)).
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3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

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- ☐ furnished subsequently to this Authority in computer readable form.
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- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

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- ☐ the claims, Nos.:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/US00/17441

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-8
	No:	Claims	
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-8
Industrial applicability (IA)	Yes:	Claims	1-8
	No:	Claims	

2. Citations and explanations
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/US00/17441

1. General

The present application does not satisfy the criteria set forth in Articles 6 and 33(3) PCT. Details of the objections are set out below.

2. Concerning Section VIII - Art. 6 PCT:

2.1. Claim 1

With the characterizing feature "the unauthorized modification includes coupling ..." an attempt is made to specify the subject-matter of an apparatus in terms of a feature that is external to the apparatus and to which the apparatus is apparently design to respond. It is considered that such a feature positioned in the characterizing portion casts doubt upon the claim's intended scope of protection (Art. 6 PCT contravened). It is considered that the feature should be positioned in the preamble, instead.

2.2. Claims 3, 6

The scope of claims of claims 3 and 6 is obscured by features put in angled brackets.

3. Concerning Section V - Articles 33(2) and 33(3) PCT

The following documents are cited:

D1: WO-A-96/00951;

D2: EP-A-0 880 311.

3.1. Claim 1

D1 (abstract; p.1 lines 3-5; p.2 lines 4-29; p.6 lines 22-25; p.5 line 23 -p.6 line 3) anticipates all features of claim 1 with the exception that claim 1 effectively specifies

- providing as the port detector a loop antenna around the port opening for detecting (magnetic fields due to) time-varying

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currents passing along (unauthorized) conductors extending through the port,

whereas D1 discloses

- providing as the port detector a capacitive antenna ("laminae" 17, 17') at the port opening for detecting a time varying electric field that is changed due to the presence of unauthorized conductors extending through the port.

The difference identified above amounts to detecting (changes of) magnetic fields instead of detecting (changes of) electric fields. Accordingly the claim specifies a loop antenna whereas D1 discloses an antenna that responds to electric fields.

The skilled person routinely seeking alternatives to the design disclosed in D1 would have considered, as an obvious design option, replacing the disclosed antenna with an antenna of a different type, in accordance with the specific requirements, and without exercise of an inventive step.

The skilled person would thus have considered using a loop antenna as exemplarily disclosed in D2 instead of the different antenna disclosed in D1. This is because the skilled person was readily aware that each time-varying electromagnetic field has both an electric and a magnetic field component, and therefore detecting the magnetic field is equivalent to detecting an electric field.

It is to be noted that although D2 discloses a loop antenna in relation to detecting leakage of radiation through a shielding, the skilled person has been aware, almost from the beginning of developments in the field of radiated waves, of the capability of loop antennas to detect magnetic fields. Using a loop antenna instead of another type of antenna is obvious from standard textbooks.

For the reasons given above, the subject-matter of claim 1 contravenes Art. 33(3) PCT.

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3.2. Claim 6

In comparison to claim 1, claim 6 provides further detail as to
(a) the detection of the radiation which requires that a time-varying current is provided in the (unauthorized) conductors; and provides

(b) a determination step to determine whether an unauthorized use of the electronic security device is made based on a capacitance (value) detected by a signature signal detected at the loop antenna.

These additional features imply the following steps:

- firstly, a time-varying electric signal is provided to the conductors that establish contact between the host device and the electronic security device;
- secondly, the time-varying electric signal establishes a current in any unauthorized wire that extends through the port, and thus a change of overall current;
- thirdly, the current change via its respective change of induced magnetic field component is detected;
- fourthly, from the current change, a change in capacitance of the device is detected (which implicitly has to differ from a standard capacitance) which change is large enough to conclude that there is unauthorized use of the security device.

D1 also discloses the first step identified above, which unavoidable results the second step, so that the first and second steps are not novel in comparison to D1.

As to the third step, the authors of D1 selected to detect the electric field, instead of the magnetic field as claimed. The third step lacks an inventive step, as set out in paragraph 3.1 above in relation to claim 1.

As to the fourth step, the authors of D1 having selected detecting the electric field had to compare a received field strength value with a standard (threshold) value so as to determine

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unauthorized use of the security device.

Thus evaluating the presence of an inventive step by claim 1 can be reduced to the question whether it was obvious or not to replace a determination based on a threshold and a detected electric or magnetic field component with a determination based on a threshold and a capacitance value determined from a detected field component.

Detecting radiation can be carried out by sensing of time-varying electric field. Such sensing unavoidably leads to the detection of a voltage signal representative of the media penetrated by the fields. This is well-known in the art and widely used in many fields of industry, such as in determining properties of organic or non-organic matter.

Any such known detection of a change in electric fields depending upon the material provided in a test volume is commonly designated as dielectric constant measurement which is equivalent to capacitance measurement.

Generally speaking detecting a capacitance is equivalent to detecting a dielectric constant in a test volume. To determine the capacitance, at least one of fields in the test volume must be detected, as is effected in both D1 and according to claim 6. It is well-known (textbook knowledge) in the art that capacitance and field strength are correlated. Thus it is considered a mere obvious design option of the skilled person to replace a determination based on detected field strength with a determination based on a capacitance value derived from a detected field strength. Accordingly, claim 6 is considered to contravene Art. 33(3) PCT.

3.3. Dependent claims

In light of the findings set out above, the explicit and implicit disclosure of D1 and the normal skills of the skilled person, an inventive step cannot be identified in any of the

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additional features of the dependent claims.

4. Concerning Section VII: Description and other belongings

(a) Documents reflecting the prior art described on pages 1 and 2 are not identified in the description (Rule 5.1(a)(ii) PCT).

(b) Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the document D1 is not summarized and the document not identified in the description.

(c) The description (p.9 lines 29 and 35) refers to capacitance values in terms of pico Farads derived from dielectric constants. The respective passages are obscured by the fact that areas' values (such as cm^2) with which the capacitance values are necessarily linked are not provided.

(d) The described features
"electromagnetic radiation consisting of both an electrostatic field ..." (p.7 lines 5-6) and
"electrostatic radiation" (p.8 lines 29 and 38)
are obscure and self-contradicting because radiation is only definable in conjunction with time-varying electromagnetic fields which are thus non-static. Electromagnetic radiation is defined as the vector product of time-varying magnetic and electric fields and can also be expressed in terms of the squares of magnetic or electric field amplitudes. An "electrostatic field" might also be present, but cannot be linked with "radiation".

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CLAIMS

1. An apparatus sensing unauthorized use of an electronic security device (108), the apparatus comprising a host device (101) with a housing (121) having an opening forming a port (112) configured to receive the electronic security device (108), the port (112) forming a limited passage into the housing (121) for passage of the electronic security device (108); and a port detector (308) for sensing radiation emitted from unauthorized modification of the electronic security device (108), the port detector (308) controlling or preventing operation of the apparatus based upon detection of said unauthorized modification, characterized in that
- the unauthorized modification includes coupling to the electronic security device (108) conductors (302) extending through the port (112) and wherein the port detector (308) has a loop antenna (306) encompassing the opening forming the port (112), the loop antenna (306) being responsive to time varying currents passing along the conductors (302).
2. The apparatus set forth in claim 1, wherein the port detector (308) detects electromagnetic radiation occurring at the port (112) having a prescribed frequency.
3. The apparatus set forth in claim 1, wherein the apparatus is operable to apply a time varying signal to the electronic security device (108), which time varying signal is detected by the port detector (308) at the loop antenna (306) as a signature signal [is detected by] and wherein the port detector (308) is responsive to variations in [as electrostatic radiation, and the detector measures] capacitance that are identifiable from the signature signal and indicate presence of said conductor (302).
4. The apparatus set forth in claim 1, wherein the electronic security device (108) emits a time varying signal detected by the port detector (308) as a signature signal at the loop antenna (306), and wherein the port detector (308) is responsive to variations in a capacitance of the electronic security device (108) that are identifiable from the signature signal.

5. The apparatus set forth in claim 1, wherein the electronic security device (108) is a smart card.

6. A method of determining unauthorized use of an electronic security device (108) [comprising:] wherein the electronic security device (108) is used in an apparatus having a housing (121) that is substantially closed but for an opening defining a port (112) for receiving the electronic security device (108) and the unauthorized use includes coupling conductors (302) to the electronic security device (108), the conductors (302) extending along a path through the port (112),
10 characterized in that:

a loop antenna (306) is placed at the opening defining the port (112), encompassing the path of any said conductors (302); and,

radiation received at the loop antenna (306) is monitored to detect unauthorized use of the electronic security device (108) by providing a time varying
15 current in the conductors (302) and detecting a resulting signature at the loop antenna (306), and determining that the electronic security device (108) has a capacitance detected by a signature signal at the loop antenna indicating presence of the conductors (302).

20 7. The method set forth in claim 6, further comprising at least limiting transfer of information between the electronic security device (108) and the host device (101) upon detection of said unauthorized use.

8. The method set forth in claim 6, wherein the electronic security device (108) is
25 a smart card.

Abstract of the Disclosure

A device for sensing unauthorized use of an electronic security device (108) has a host device (101) and a detector with a loop antenna (306) associated with the port (112) that receives the electronic security device (108), such as a smart card. The host device comprises a housing (121) having the port formed therein. In one embodiment, the port detector senses radiation emitted from unauthorized use of the electronic security device by attachment of hot-wire conductors to the security device, which conductors carry currents through the port and the detector. In an alternate embodiment, the dielectric constant of the electronic security device (108) is measured and compared to a predetermined value for distinguishing a nominal device from one with attached hot wiring.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference RCA89349	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/US 00/ 17441	International filing date (day/month/year) 26/06/2000	(Earliest) Priority Date (day/month/year) 15/07/1999
Applicant THOMSON LICENSING S.A. et al.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 2 sheets.



It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).
- b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing:
- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

2. ☐ Certain claims were found unsearchable (See Box I).

3. ☐ Unity of invention is lacking (see Box II).

4. With regard to the title,



the text is approved as submitted by the applicant.



the text has been established by this Authority to read as follows:

5. With regard to the abstract,



the text is approved as submitted by the applicant.



the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No.



as suggested by the applicant.



because the applicant failed to suggest a figure.



because this figure better characterizes the invention.

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None of the figures.